

Aeronautical Telecommunications Network (ATN)

The Aeronautical Telecommunications Network (ATN) is a global networking infrastructure that will "extend the information superhighway to the world of aviation."

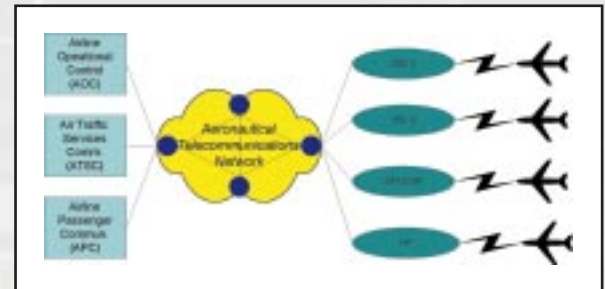
This communications infrastructure will connect different types of ground applications (AOC, ATSC, and APC) to corresponding air applications over different air-ground subnetworks (VDL-3, VDL-2, SATCOM, and HF). See figure to the right.

The ground and air applications reside in end systems which contain an Open Systems Interconnect (OSI)-based, 7-layer stack of communications protocols. The ATN stack provides a means of conveying bit-oriented (as opposed to the previous character-oriented) data between ground and air applications. The ATN end systems follow a protocol architecture which has efficiency enhancements to eliminate overhead otherwise associated with upper layer protocols and which provide a common abstract service interface for ATN Application Service Elements (ASE).

The ATN ground-based end systems are connected to aircraft end systems through a network of Intermediate Systems or ATN Routers. ATN Routers maintain continuous paths to aircraft using the OSI distributed adaptive routing protocol IDRP.

Technical Center Activities

The Data Link Branch (ACT-350) of the Communications/Navigation/Surveillance Engineering and Test Division performs the following ATN related activities:



- ATNSI Support
- ATN Test Bed Development
- Interoperability Testing
- Subnetwork Development
- Operational Test and Evaluation

ATNSI

ATNSI is an industry-based cooperative venture with the FAA which is developing a suite of ATN avionics and ground system components, i.e., ATN end systems and routers. The ATNSI end systems and router components are collectively referred to as the Router Reference Implementation (RRI). The DRT consists of experts from government and industry which provide input to the RRI and the Conformance Test Suite (CTS), also being developed under ATNSI. The DRT by consensus, determines acceptance of deliverables and corrective action in the event of deliverable rejection. ACT-350's support includes participation in various program reviews and review and comment on both RRI and CTS documentation. ACT-350 will provide an independent evaluation of interim and final software and hardware deliveries to determine the suitability of these products in FAA ground automation systems.



System Efficiency

Ground ASE and Network Management Development Coordination

ACT-350 provides technical support to the ATNSI Ground ASE and Network Management Development Coordination groups. The RRI contract includes options to develop ground ASEs for Context Management (CM) and Controller Pilot Data Link Communications (CPDLC) and for Network Management products. ACT-350's participation in the coordination groups will facilitate incorporation of these products or the equivalent functionality into ground automation systems.

ATN Test Bed

ACT-350 is developing a multifunction ATN test bed. The test bed consists of ATN routers, end systems, and simulators which can be configured for testing any combination of ATNSI products, ATN subnetworks, and ATN applications. The ATN test bed router was developed from the Data Link Processor (DLP) and has been rehosted to a number of PC and workstation environments. Router functionality is fully compliant with ICAO Standards and Recommended Practices (SARPs).

Near-term activities will add an open Network Management capability and support for traffic types to the router.

Interoperability Testing

The ATN test bed will be used for interoperability of RRI products as they become available. The test bed contains independently developed, SARPs-compliant implementations of ATN components which can be configured to emulate the expected environment, including maximum load conditions.

Subnetwork Development

The ATN test bed will be used by the FAA for development of the FAA's VHF Data Link Mode 3 (TDMA) subnetwork. It is also available for use in testing other subnetworks such as VDL Mode 2.

Operational Test and Evaluation

The ATN test bed will be used for Operational Test and Evaluation of FAA automation systems which implement the CPDLC and CM applications. It can also be used for Flight Information Service (FIS) applications.

For additional information, contact:

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